ABSTRACT:

Small angle neutron scattering (SANS) technique has been widely employed in probing the microstructure of amorphous materials in the nanometer range. In aerogels system, the size range of 1 – 100 nm is of particular interest since the structural units, such as the pores and particles, often fall in this range. In a typical scattering experiment, scattered neutron intensity is measured as a function of the scattering angle. Various plots of intensity I(Q) and scattering vector, Q, can provide information about fractal dimensions, and particle and cluster sizes. In this study, SANS facilities, at Nuklear Malaysia (NM) and Badan Tenaga Atom Nasional (BATAN), Indonesia were used to analyse particle and cluster size of silica aerogels and titanium containing silica aerogels. Results from NM showed that silica aerogels have surface fractal dimension while titanium containing silica aerogels have mass fractal dimension. On the other hand, results from BATAN showed that both silica aerogels and titanium containing silica aerogels have mass fractal dimension. The particle size for silica aerogels and titanium containing silica aerogels samples obtained by NM were 11.18 ± 0.03 and 9.19 ± 0.06 nm, respectively while the respective values obtained from BATAN measurements were 11.78 ± 0.06 and 10.57 ± 0.07 nm.